

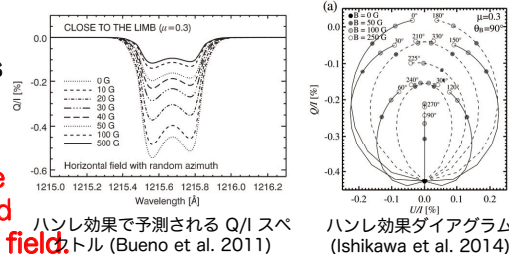
Chromospheric Lyman-Alpha SpectroPolarimeter (CLASP)

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Science Target

It is expected that the linear polarization in Ly-alpha line varies depending on the photospheric magnetic fields (strength and direction) (by Atomic polarization + Hanle effect).

CLASP aims ① to detect the linear polarization in Ly-alpha line with 0.1 % accuracy, ② to detect the linear polarization caused by the Hanle effect, and ③ to infer the photospheric magnetic field.

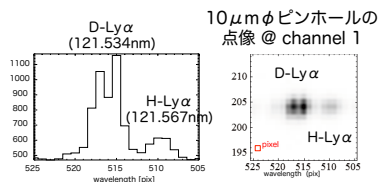


Novel optical design for the high precision polarization measurement (Narukage et al. 2015)

1. Simultaneous observation of orthogonal linear polarization with optically symmetric dual channel
2. High throughput optics with high reflectivity coating

Wavelength resolution of the SP

$\sigma \sim 0.003 \text{ nm}$



Calibration of the spectropolarimeter

CLASP achieves the polarization accuracy of 0.1%.

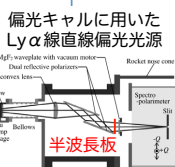
【Mueller matrix of CLASP SP1】

$$\begin{pmatrix} I_{\text{CLASP}} \\ Q_{\text{CLASP}} \\ U_{\text{CLASP}} \end{pmatrix} = \begin{pmatrix} 1 & 0 & 0 \\ 0.0020 & 0.977 & 0.009 \\ -0.0004 & -0.009 & 0.977 \end{pmatrix} \begin{pmatrix} I_{\text{Sun}} \\ Q_{\text{Sun}} \\ U_{\text{Sun}} \end{pmatrix}$$

	Torrance	Torrance in Mueller matrix	Error in calibration
Spurious pol.	0.01 %	0.0001	~ 0.0001
Scale error	2 %	0.02	~ 0.0005
Azimuth error	0.5 degree	0.01	~ 0.002

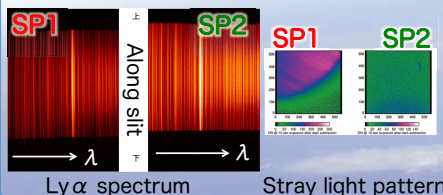
Preliminary Result
 最終版は Giono et al. 2015

SP2 も同程度の値と測定誤差

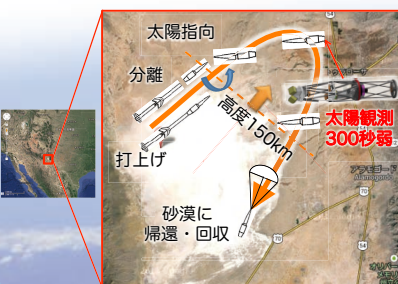


Throughput & Stray light

CLASP can collect $>10^7$ photons during five minutes. The stray light is suppressed to $<0.3 \%$ of expected Ly-alpha signal.

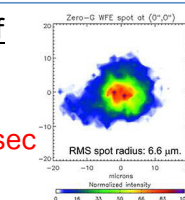


CLASP will be launched in August 2015



Spatial resolution of the telescope

Spot RMS radius $6.6 \mu\text{m} = 0.53 \text{ arcsec}$



Spatial resolution of SJ optics

Spot RMS radius $22 \mu\text{m} = 1.76 \text{ arcsec}$

